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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,530	09/22/2003	John S. Harchanko	MEMS-0178-US (old number	5923
60601	7590	11/22/2006	EXAMINER	
MCGRATH, GEISSLER, OLDS & RICHARDSON, PLLC P.O. BOX 1364 FAIRFAX, VA 22038-1364			STULTZ, JESSICA T	
			ART UNIT	PAPER NUMBER
			2873	

DATE MAILED: 11/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,530

Applicant(s)

HARCHANKO, JOHN S.

Examiner

Jessica T. Stultz

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 0906.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Examiner's Comments

For applicant's information, the amendment to claim 15, filed September 22, 2006, overcomes the previous objection to this claim.

Claim Objections

Claims 24-26 are objected to because of the following informalities: claim 24, lines 2-3, "along the substantially the same" should be "along substantially the same"; claim 25, lines 2-3, "in the substantially perpendicular with" should be "in a substantially perpendicular direction with"; and claim 26, line 2, "the reference optical element is lens" should be "the reference optical element is a lens". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15-16, 18, and 20-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Chiu et al US 7,006,426, herein referred to as Chiu et al '426.

Regarding claim 15, Chiu et al '426 discloses a multi-optical element device comprising: at least one reference optical element (Column 1, lines 28-39 and Column 2, lines 12-31, wherein the reference optical element is one of the lens elements "12", Figures 1-4); a mounting system, wherein the mounting system is formed by etching a substrate to form a recess to receive a

Art Unit: 2873

reference optical element (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the mounting element “20” is etched to form recesses “48” and “50” in base elements “22”, Figures 1-4), where said recess at least partially conforms to the shape of the reference optical element (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the recesses “48” and “50” are shaped to conform to the shape of extensions “44” and “46” of lens element “12”, Figure 4) , and wherein the reference optical element is attached to the recess in the substrate (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the lens elements “12” are attached and aligned with the substrate “20” by connection with the recesses “48” and “50”, Figure 4), the mounting system contains an etched substrate forming structures upon which optical devices can be attached (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the mounting element “20” includes structures “22” upon which lens elements “12” are attached, Figures 1-4); and at least a first optical element attached to a predetermined structure of the etched structures (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein additional lens elements “12” are attached to the structures “22” of mounting element “20”, Figures 1-4).

Regarding claim 16, Chiu et al ‘426 further discloses that the reference optical element and/or the first optical element are made from glass (Column 1, lines 28-39, wherein the lens elements “12” are made from glass, Figures 1-4).

Regarding claim 18, Chiu et al ‘426 further discloses that the etched structure is covered with a filling compound to change the index of refraction (Column 2, line 32-Column 3, line 8, wherein the etched structures “22” are coated with thin films to change the reflectivity, i.e. the refractive index, of the mounting structures and at least partly fill the space between the

Art Unit: 2873

mounting structures and the optical elements, and wherein the structures are also coated with an adhesive for bonding).

Regarding claims 20-23, Chiu et al '426 further discloses that the thickness of the reference and first optical elements are between several millimeters and 1 nanometer (Column 1, lines 40-53, wherein the thickness of the wafer used to form lens elements "12" is 0.75 mm, Figures 1-4).

Regarding claim 24, Chiu et al '426 further discloses that the reference optical element and the first optical element are aligned along substantially the same optical axis (Column 3, line 50-Column 4, line 4, wherein the light beam passes along the optical elements "12" through a horizontal optical axis "84", wherein the optical elements "12" are substantially aligned along this axis, Figures 1-4).

Regarding claim 25, Chiu et al '426 further discloses that the reference optical element and the first optical element are aligned in a substantially perpendicular direction with respect to a line through the center of each optical element (Column 3, line 50-Column 4, line 4, wherein the optical elements "12" including the reference optical element and the first optical element are aligned perpendicular to a line drawn through the center of the optical elements in the horizontal direction, Figures 1-4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu et al '426 as applied to independent claim 15 above.

Regarding claim 17, Chiu et al '426 discloses a multi-optical element as shown above, but does not specifically disclose that the optical elements are made from GaP. However, it is well known in the art of optical elements in semiconductor devices to be made of GaP for the purpose of making elements with narrow band gaps and good lattice conformity. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the optical elements of Chiu et al '426 to be made from GaP since it is well known in the art of optical elements in semiconductor devices to be made of GaP for the purpose of making elements with narrow band gaps and good lattice conformity.

Regarding claim 26, Chiu et al '426 discloses a reference optical lens element as shown above, but does not specifically disclose that the reference optical element has a convex surface shape to fill a curved shaped of a recess of the mounting structure. However, it is well known in the art of optical elements for optical elements to be convex shaped and for the recesses of the mounting structure to have a curved shaped for the purpose of providing a more uniform distribution of light through the optical device. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the reference optical lens element of Chiu et al '426 to have a convex shape to fill a curved shaped of a recess of the mounting structure since it is well known in the art of optical elements for optical elements to be convex shaped and for the recesses of the mounting structure to have a curved shaped for the purpose of providing a more uniform distribution of light through the optical device.

Regarding claim 27, Chiu et al '426 discloses a multi-optical element as shown above wherein the etched structure forms a cavity and the reference optical element is located inside the cavity (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the lens elements "12" are attached and aligned with the substrate "20" by being held in recesses "48" and "50", Figure 4), including a filling compound (Column 2, line 32-Column 3, line 8, wherein the etched structures "22" are coated with thin films to change the reflectivity, i.e. the refractive index, of the mounting structures and at least partly fill the space between the mounting structures and the optical elements, and wherein the structures are also coated with an adhesive for bonding), but does not specifically disclose that the filling compound is used to fill the cavity. However, it is well known in the art of optical elements for the elements to be held together by cavities filled with adhesive for the purpose of forming strong bonds between the optical elements and thereby decrease movement of the elements. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for the filling compound of Chiu et al '426 to fill the cavity since it is well known in the art of optical elements for the elements to be held together by cavities filled with adhesive for the purpose of forming strong bonds between the optical elements and thereby decrease movement of the elements.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu et al '426 as applied to independent claim 15 above, and further in view of Hafner et al US 6,716,409, herein referred to as Hafner et al '409.

Regarding claim 19, Chiu et al '426 discloses a multi-optical element including a filling compound as shown above, but does not specifically disclose that the filling compound is Epoxy-Master Bond EP19HT. Hafner et al '409 teaches of using an optical adhesive, specifically

Art Unit: 2873

Epoxy-Master Bond EP19HT, join nanotubes to a silicon material (Column 11, lines 1-25, wherein nanotubes are joined to silicon with EP19HT) for the purpose of providing an adhesive that will not cure with exposure to air or water and can withstand exposure to water once cured (Column 11, lines 1-25). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the filling compound of Chiu et al '426 to be Epoxy-Master Bond EP19HT since Hafner et al '409 teaches of using an optical adhesive, specifically Epoxy-Master Bond EP19HT, join nanotubes to a silicon material for the purpose of providing an adhesive that will not cure with exposure to air or water and can withstand exposure to water once cured.

Examiner's Comments

For applicant's information, based on the applicant's arguments filed September 22, 2006 with respect to the 112, second paragraph rejection of claims 20-23, applicant argues that the term "the size of" is not an indefinite term since it merely provides an order of magnitude as to what range in size the element may be. Therefore the term "the size of" is interpreted to indicated the size of any dimension of the optical elements, specifically, the "thickness, width, length, or depth" of the optical elements.

Response to Arguments

Applicant's arguments filed September 22, 2006 have been fully considered but they are not persuasive. Specifically applicant argues that the optical element "12" cannot be both the reference optical element and the first optical element. However, the examiner disagrees, since there are multiple optical elements "12" attached to the mounted system of Chui et al '426 and therefore one of the optical elements is the reference element and the others are the "at least first

Art Unit: 2873

optical elements” (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein additional lens elements “12” are attached to the structures “22” of mounting element “20”, Figures 1-4). Additionally, applicant argues that the “reflective thin films” of Chiu et al ‘426 are not a filling compound to change the index of refraction. However, the examiner disagrees since these films change the reflectivity, and thereby the refractive index, of the mounting structures and at least partly fills the space between the mounting structures and the optical elements and thereby is a filling compound that changes the index of refraction. The applicant also argues that the Epoxy-Master Bond EP19HT of Hafner et al ‘409 is not a filling compound between optical elements. However, the examiner disagrees since the Epoxy-Master Bond EP19HT of Hafner et al ‘409 is defined as an optical adhesive and is used to form an adhesive between nanotubes and silicon tips, wherein the nanotubes and silicon tips are used in microscopy and are therefore optical elements as shown above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 2873

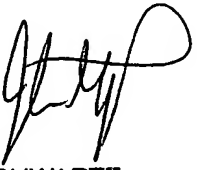
however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica T. Stultz whose telephone number is (571) 272-2339.

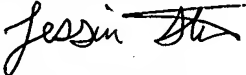
The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JORDAN SCHWARTZ
PRIMARY EXAMINER



Jessica T Stultz
Examiner
Art Unit 2873
November 16, 2006